

### REMARKS

Favorable consideration of this Application as presently amended and in light of the following discussion is respectfully requested.

After entry of the foregoing Amendment, Claims 2-15 and 17-28 are pending in the present Application. Claims 27 and 28 are new. Support for the new claims can be found at least in the original specification, claims and drawings. No new matter has been added.

By way of summary, the Official Action of March 9, 2006 presents the following issues: Claims 6, 7, 14, 18, 19, and 21-26 stand rejected under 35 U.S.C. § 102 as being anticipated by Greenstein et al. (U.S. Patent No. 6,131,016, hereinafter Greenstein); Claim 8 stands rejected under 35 U.S.C. § 103 as being unpatentable over Greenstein, as applied to Claim 25 above, in view of Minami et al. (U.S. Patent No. 6,587,510, hereinafter Minami); and, claim 15 stands rejected under 35 U.S.C. § 103 as being unpatentable over Greenstein, as applied to Claim 25, in view of Ocenasek et al. (U.S. Patent No. 6,674,324, hereinafter Ocenasek).

Applicants appreciatively acknowledge the indication of allowable subject matter recited in Claims 2-5, 9-13 and 17. However, as Applicants submit that the independent claims patently define over the applied references, these dependent claims are maintained in their present form.

### REJECTION UNDER 35 U.S.C. § 102

The outstanding Official Action has rejected Claims 6, 7, 14, 18, 19, and 21-26 under 35 U.S.C. § 102 as being unpatentable over Greenstein. The Official Action contends that Greenstein discloses all of the Applicants' claimed features. Applicants respectfully traverse the rejection.

By way of background, in signal carrier communication systems, face comparison is typically done by comparison of pilot symbols. Orthogonal Frequency Division Multiplexing

(OFDM) systems are known in which adaptive antenna arrays are utilized. In OFDM systems, the available frequency band used for communication is divided in a plurality of frequency subcarriers, whereby adjacent frequency subcarriers are respectively orthogonal to each other. In such systems, co-channel interference is present and is estimated based upon correlation of received signals at a receiver side.<sup>1</sup>

In light of at least the above noted deficiencies in the art, the present advancements are provided. With at least the above object in mind, a brief comparison of the claimed advancements, in view of the cited references, is believed to be in order.

Applicants' Claim 21, recites, *inter alia*, a method for transmitting signals using a plurality of subcarriers through a plurality of antenna elements in a multicarrier transmission system, the method including:

. . . detecting subcarrier channel response vectors corresponding to said plurality of antenna elements, wherein each of said channel response vectors includes subcarrier related elements corresponding to said plurality of subcarriers, and  
adjusting transmission characteristics of said plurality of subcarriers in accordance with amplitude and/or phase of at least one of said detected subcarrier channel response vectors. (emphasis added)

Greenstein describes a system for transmitting multi-carrier OFDM signals, including pilot tones. As shown in Fig. 2B, the downlink receiver, or terminal, performs differential phase detection of successive received pilot tones. In operation, the receiving terminal compares the strength of successive received pilot tones, and, determines which of the channels, that is the air channels associated with the respective transmit antenna, is currently carrying the stronger pilot tone. The terminal then sends this information back to the base station to select a corresponding transmission antenna.<sup>2</sup> As the pilot channel is representative of a cluster of subcarriers, the phase adjustment process is performed with respect to the

---

<sup>1</sup> Application at pages 1-2.

<sup>2</sup> Greenstein at column 4, lines 53-63.

propagation channels depending on the detected phase of the pilot tone. As shown in Fig. 2A, the weighting factors (w1) and (w2) are single values, which are applied to the propagation channel as a whole.

Conversely, in an exemplary embodiment of the Applicants' advancements, a transmission system is provided, in which signals are received through a plurality of antenna elements via a plurality of subcarriers. Each of the subcarrier transmission characteristics are adjusted in accordance with a detected subcarrier channel response vector. In this way, the subcarrier characteristics (e.g., phases) are adjusted to reduce multipath fading in the multicarrier transmission system.

In the Advisory Action of July 28, 2006 reference was made to column 3 lines 17-22, which was alleged as describing non-pilot tones being adjusted in response to a feedback signal. However, as noted above, the pilot symbol is representative of a cluster of subcarriers. For example, as noted in column 3 at lines 4-5 "within the tone cluster one tone is selected as a pilot tone." As can be appreciated upon review of Figure 2A of Greenstein weighting factors (w1) and (w2) are single values which are applied to the entirety of the cluster including all of the subcarriers of the cluster which are adjusted with weighting factors (w1) and (w2). As Greenstein does not disclose, or suggest, adjusting individual subcarrier characteristics of a multicarrier transmission system based upon obtained vector elements of each subcarrier, but, instead, a pilot tone, which provides values for adjusting the entirety of a cluster, Applicants respectfully submit that Applicants' amended Claim 21 and any claim depending therefrom is patentably distinguished over the cited reference. Likewise, as independent Claims 22-26 recite substantially similar limitations to that discussed above, Applicants submit that these claims, and any claims depending therefrom, are also allowable over the cited reference.

Accordingly, Applicants respectfully request that the rejection of Claim 6, 7, 14, 18, 19, and 21-26 under 35 U.S.C. § 102 be withdrawn.

The Official Action has rejected Claim 8 under 35 U.S.C. § 103 as being unpatentable over Greenstein in view of Minami. The Official Action contends that Greenstein discloses all of the Applicants' claim limitations, with the exception of limiting an adjustment of the magnitude of a sub-carrier signal to an upper threshold. However, the Official Action cites Minami as disclosing this feature of the Applicants' claim and states that it would have been obvious to one of ordinary skill in the art to combine the cited references for arriving at the Applicants' claims. Applicants respectfully traverse the rejection.

As noted above, Greenstein does not disclose all of the elements of the Applicants' claims for which it has been asserted. As Minami does not remedy the deficiency discussed above, Applicants respectfully submit that a *prima facie* case of obviousness has not been presented.

Accordingly, Applicants respectfully request that the rejection of Claim 8 under 35 U.S.C. § 103 be withdrawn.

The Official Action has rejected Claim 15 under 35 U.S.C. § 103 as being unpatentable over Greenstein in view of Ocenasek. The Official Action contends that Greenstein discloses all of the Applicants' claim limitations with the exception of a software implementation. However, the Official Action cites Ocenasek as describing this more detailed aspect of the Applicants' claim, and states that it would have been obvious to one of ordinary skill in the art to combine the cited references for arriving at the Applicants' claims. Applicants respectfully traverse the rejection.

As noted above, Greenstein does not disclose, or suggest, all of the elements for which it has been asserted. As Ocenasek does not remedy the deficiency discussed above, Applicants respectfully submit that a *prima facie* case of obviousness has not been presented.

Accordingly, Applicants respectfully request that the rejection of Claim 25 under 35 U.S.C. § 103 be withdrawn.

NEW CLAIMS

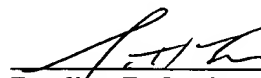
New Claims 27 and 28 have been added to recite more detailed aspects of the Applicants' claimed advancements, which are neither shown nor suggested by the cited references as discussed above. Accordingly, Applicants respectfully submit that these claims are allowable over the cited references.

CONCLUSION

Consequently, in view of the foregoing amendment and remarks, it is respectfully submitted that the present Application, including Claims 2-15 and 17-26, is patently distinguished over the prior art, in condition for allowance, and such action is respectfully requested at an early date.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.



Bradley D. Lytle  
Attorney of Record  
Registration No. 40,073  
Scott A. McKeown  
Registration No. 42,866

Customer Number

**22850**

Tel: (703) 413-3000  
Fax: (703) 413 -2220  
(OSMMN 06/04)

BDL:SAM:ys

I:\ATTY\SAM\PROSECUTION WORK\282452\282452US-AM-31AUG06.DOC